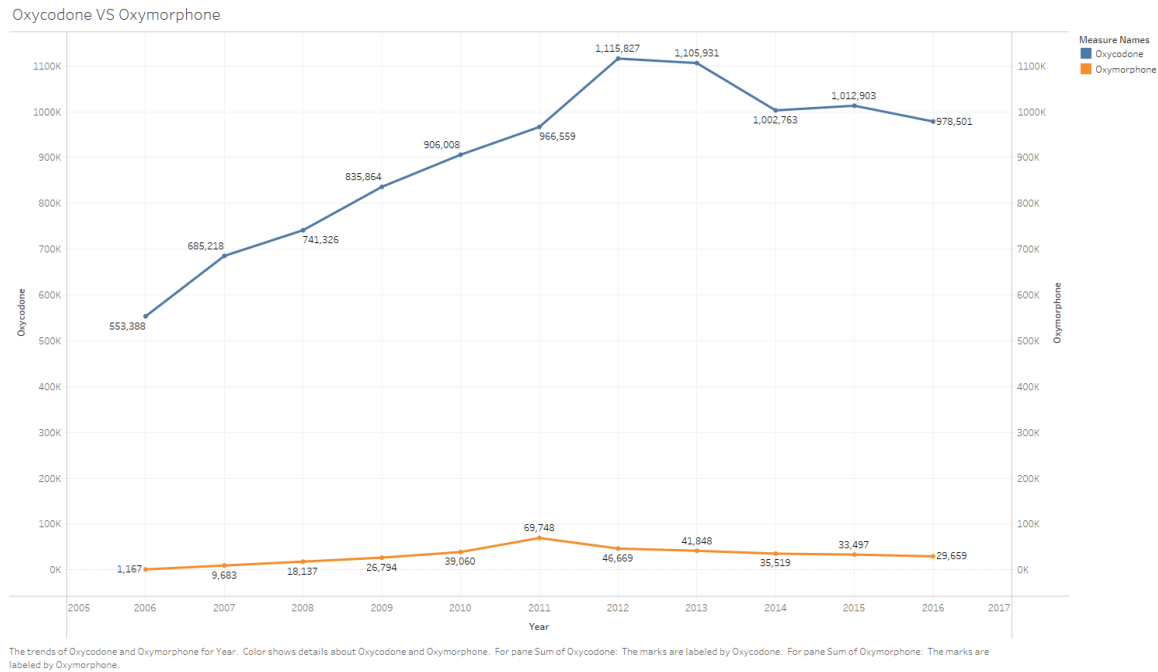**JGN Data - Opioid Abuse in Indiana**



Figure Caption: Line graph representing the number of prescriptions of two of the more commonly abused opioids provided in the dataset. It shows a rise in prescriptions starting at the beginning of the data collection in 2006, and the start of a decline at around the same time for both drugs, 2012 for Oxymorphone and 2011 for Oxycodone.

**Team name: JGN Data**

| Name (full name) | Purdue Email address |
|---|---|
| Joshua Bailey | baile268@purdue.edu |
| George Wu | gjwu@purdue.edu |
| Nathan Rusk | nrusk@purdue.edu |

# Table of Contents

# JGN DATA

## Introduction

In this section, Introduce your topic.

Our topic is the opioid epidemic in Indiana. It is a very well-known, widespread, important and very problematic issue, not just in Indiana.

## Background

In this section provide background about the data – what dataset did the team choose and why? What additional data was acquired by the team? Why? Explain.

We chose the datasets provided on Brightspace that were about the opioid epidemic. Specifically, we chose the Demographic Data, Frequency Data, and MME Equivalent Data datasets. We also found more data on the Indiana Department of Health website that gave us opioid prescription and overdose death counts. We chose these datasets because we thought they would give us the most information and insight regarding the opioid epidemic.

## Questions

What is the question(s) the team has chosen to address? Who is your audience? – What problem are you trying to solve or address? What's been done before?

We have chosen to address the question of "How does age affect the opioid epidemic?". Our audience could really be anyone who cares, but mainly, it is the law enforcement, healthcare workers, and the government officials of Indiana. Law enforcement and healthcare workers care because it is their job to prevent overdose deaths. Government officials care because they will know which age group is most vulnerable and restrict or ban opioid prescriptions to that age group. There are things being done to combat the epidemic. For instance, awareness is being spread. Also, help facilities exist to help people who abuse opioids quit doing so. Finally, prescriptions seem to be going down because of stricter laws, and doctors prescribe less opioids.

## Problem Statement

How has the data been visualized before? Significance (why should anyone care)? – why is the team's work important?

The data has been visualized a lot on the Indiana Department of Health website. It has been visualized as a horizontal bar chart as well as a map of the counties of Indiana, with the darker the color, the more opioid deaths there were. People should care because people are dying, and the epidemic is costing the economy a lot of money. We are finding age groups that are at most risk so that preventative measures can be put into place, such as laws and more facilities to help those who abuse opioids.

## Methodology

What did the team do? Show your process, include sketches

We met on Discord a lot of times, to share ideas on what the data visualization should look like, and to work on the report and the PowerPoint (for the video). We agreed that the visualization must look aesthetically pleasing as well as concise. We did not sketch any ideas. Rather, we just decided to directly use Tableau to make our visualizations. We decided together which visualizations to use. We did not use all of them, as some of them were either inferior versions of others and/or we felt they did not contribute enough to the story.

## Results

Choose one of your team's "BEST" visualizations and insert it here. This visualization should be the best representation of the team's effort. Provide a figure caption. ~~This section should only contain the visualization and the figure caption~~

Opioid Deaths by Age Range in Indiana
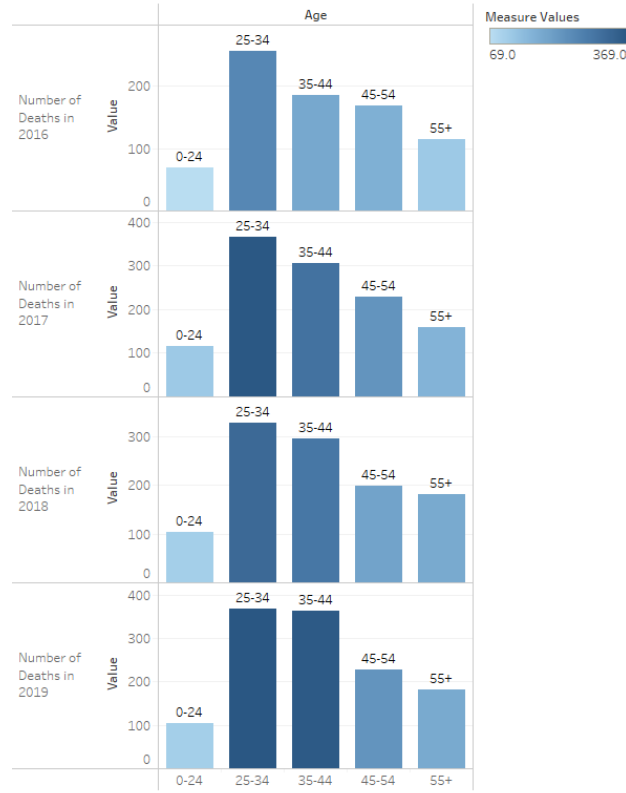


Number of Deaths in 2016, Number of Deaths in 2017, Number of Deaths in 2018 and Number of Deaths in 2019 for each Age. Color shows Number of Deaths in 2016, Number of Deaths in 2017, Number of Deaths in 2018 and Number of Deaths in 2019. The marks are labeled by Age. The view is filtered on Age, which keeps 0-24, 25-34, 35-44, 45-54 and 55+.

Figure Caption: A collection of bar graphs representing opioid deaths according to age in Indiana across four years, 2016-2019. The age range of 25-34 being the most at risk and ages 0-24 being the least at risk. Order of risk stays consistent across all years and age groups.

Created By: Joshua Bailey

# Discussion and Conclusion

Discuss your results (the figures in the Results section). Do your visualizations address the problem stated in the Problem Statement Section? Explain.

Our group discovered that the age group at most risk was 25-34 years old, this was true for years 2016-2019 so the data is consistent. We also discovered that the least at-risk range is 0-24 but it is still consistently around 100 deaths each year which is still a large number. The visualization also shows that the 35-44 age range is growing each year and is catching up with the 25-34 range. Our visualization does address the problem by showing what age ranges are at most risk and need help. Our group would recommend that Indiana opens more help centers that target these at-risk age ranges. We also encourage Indiana to spread more awareness about this problem, that is the Opioid epidemic.

# References

If references are listed, make sure they are cited in the body of the document.

-Main datasets provided (Opioid Abuse in Indiana)

-Opioid Overdose Deaths by Age Group via KFF analysis of Centers for Disease Control and Prevention (CDC), National Center for Health Statistics. (KFF.org)

-Indiana State Department of Health via www.in.gov from the Division of Trauma and Injury Prevention Data Analysis Team

# Appendix A – Resources Used

## Datasets

List the name of the data set provided and a description of the additional data set acquired.

-Opioid Abuse in Indiana

-Demographic Data

-Frequency Data

-Morphine Milligram Equivalent (MME) Data

-Additional data about opioid overdose deaths by age group found via KFF.org

-Additional Data about opioid overdoses per county in Indiana was used for individual contributions and found via Indiana State Department of Health (www.in.gov)

## Tools used

List all tools used in the project and a brief description (see the examples below); add more if applicable.

| Tool/Application | Description |
|---|---|
| Excel | Data cleaning/Original Dataset Files |
| Tableau | Data visualization |
| HTML/CSS | Web development |
| GitHub | Website hosting |
| Word | Text editor |
| PowerPoint | Presentation |
| SharePoint | Collaborative Text Editor |
| Visual Studio Code | Text editor for web development |
| Discord | Team Communication/Meeting |
| OBS | Screen Recording Software |

# Appendix B – Percent Contribution

## Group Contributions

In this section list the tasks that were completed by all team members for example: contributed to the data visualization process, brain stormed topic ideas, served as rotating team leader, contributed content to the short story (summary), contributed content to the 5-minute video, reading the final deliverable before submission,

Many of the tasks and deliverables for this group Hackathon project were done collaboratively. We were able to set up the Hackathon report and PowerPoint in SharePoint, which allowed us to each work on the same document simultaneously, which improved efficiency.

We had multiple meetings in which we were able to collectively brainstorm about ideas and possible outcomes for the project and how we could gain insight from the data.

All of us were able to contribute to the PowerPoint presentation in which we later divided into sections and each of us made a video presenting our portion, which collectively makes up our team video.

We rotated team leaders for the group every week which made it so everyone got to lead the team at least once. The team was able to agree on most aspects of the project, making the final product easier to decide upon.

## Individual Contributions

In the table below list each team member's full name, their contribution (body of work) and their % of the work completed. The total must add up to 100%

| Team Member | Description | Contribution |
|---|---|---|
| *Joshua Bailey* | *Worked on PowerPoint, visualization, Hackathon Report, Edited Video, and Acquired additional data.* | *33.3333%* |
| *George Wu* | *Worked on the PowerPoint (Design and Content), research, read the first four slides in the video, did a lot of the report (diversity statement, hometown, etc.), helped work on visualizations* | *33.3333%* |
| *Nathan Rusk* | *Website, Hackathon report and PowerPoint/presentation/video contributions, individual hometown contributions* | *33.3333%* |
| | Total | 100% |

## Appendix C – Individual Contributions

In this appendix each team member must contribute a one-page document relating the team's topic/data to their home town or home country. The one-page document must contain: (1) a description of the problem, (2) a comparison of the team's findings with insights about your home town/country related to the hackathon data (3) a visualization to support items (1) and (2).

Each person should create their individual page **(1-page only)** and make it available to the designated team member who will upload the final document.

This will be viewed and assessed as part of each person's individual contribution.

Leave this page as is.

Start adding individual page content on the next page.

REMOVE any blank pages before submitting.

## Team Member #1:   Joshua Bailey

My Hometown/City/Country:  **Newton County / Demotte**

Hackathon Topic (dataset): **Opioid Abuse in Indiana**

Include your story and visualization below.

The problem is that Indiana is facing a major opioid epidemic. People are dying every single day from these drugs. Doctors are prescribing way too many opioids causing their patients to become addicted and when they run out of medication they turn to other less legal methods. We found as a team that in 2021 there were 1007 deaths due to opioid overdoses in Indiana all together. I assumed that my hometown/county would not contribute to this number in a major way since I am from a small town and my county does not have any major cities. My Counts also has a low population compared to many other counties. In 2021 Newton County had 4 deaths due to opioid overdoses. This is not a significant amount when compared to the total number. This does tell us however that the epidemic is wide reaching because it even effects small towns and counties. I personally have known someone from my county to overdose and die from an opioid overdose so I know firsthand what this epidemic can do to families.
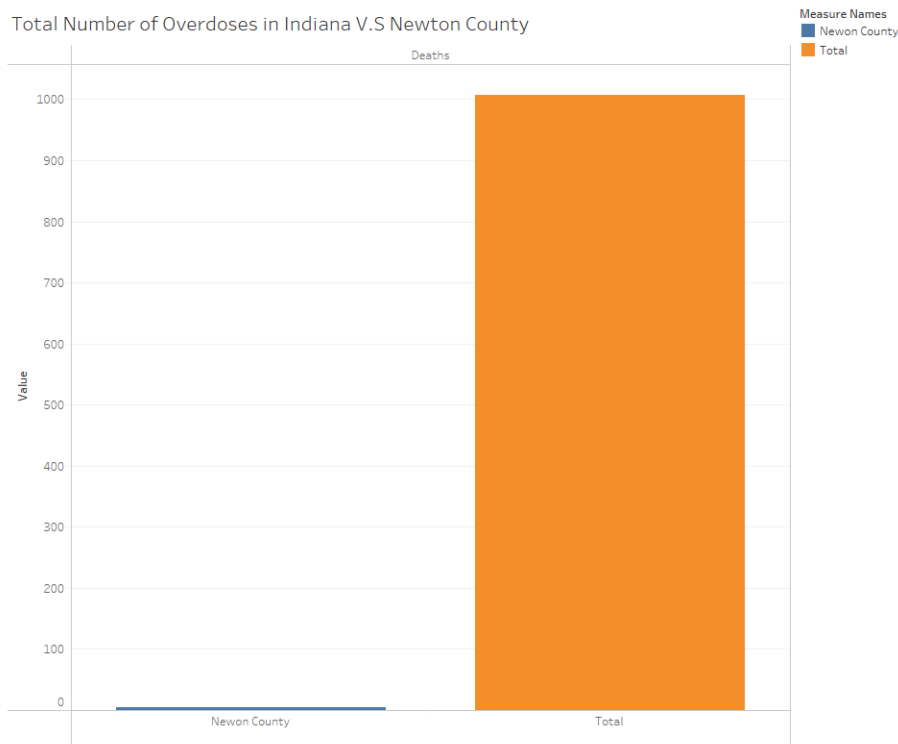
## Team Member #2:   George Wu

My Hometown/City/Country:     **Fishers, Hamilton County, Indiana, United States**
             Hackathon Topic (dataset): **Opioid Abuse in Indiana**
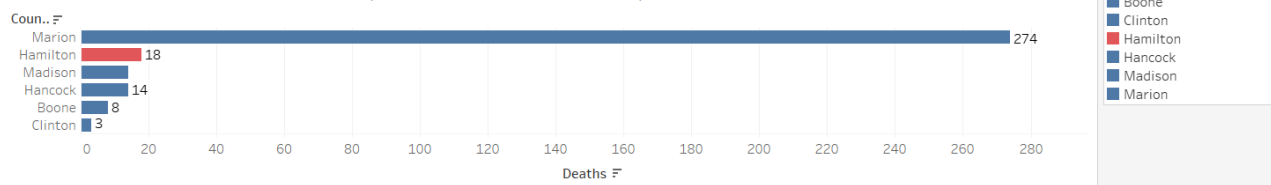
Include your story and visualization below.

Opioids are a type of prescription painkiller. They are mainly prescribed to people who suffer from large amounts of pain. However, they are very addictive, and it is easy for a person to become addicted to opioids. Thus, there is a huge opioid abuse issue, especially in the state of Indiana.

I have heard that opioid abuse is a large problem in Hamilton County, which is my home county. We were always taught that opioids were highly addictive, and were shown a documentary in school that showed how big the issue was. We also learned that opioid addiction destroys lives in many ways. People who overdose have their lives literally destroyed, because they either die, or they face criminal charges which can ruin their lives. The families of those who abuse opioids also suffer. Finally, the opioid epidemic is chewing up precious money that could have been used elsewhere, such as education or infrastructure, had the epidemic not existed.

I know how bad the problem is in my home county but I wanted to compare it to surrounding counties, to see how it compares to surrounding counties, since they might have similar numbers due to being in close proximity.

It turns out that while Hamilton County does have a big opioid epidemic problem, Marion County has the most opioid overdose deaths out of the six counties I looked at. I think it is because of the population. Marion county has a huge population due to Indianapolis, the capital and largest city of Indiana, being in that county. Hamilton county is a relatively large county too. Judging by this data, it is probably more accurate to look at the number of opioid overdose deaths per 1000 or 10000 people rather than looking at the total number of opioid overdose deaths.

## Team Member #3:   Nathan Rusk

My Hometown/City/Country: **Clinton County, Frankfort, Indiana**

Hackathon Topic (dataset): **Opioid Abuse in Indiana**

Include your story and visualization below.

The problem being presented in relation to my home county, is the issue with drug poisoning or overdosing, most of which are caused by opioids, but not all. With the help of some information found via the Indiana State Department of Health on www.in.gov from the division of Trauma and Injury Prevention data analysis team, I was able to create some visualizations representing how my home county of Clinton County, Indiana compares to the counties with the highest and lowest numbers of overdoses in Indiana.

Clinton County falls in around the middle of the lower levels of overdoses per county at 15.9 overdoses per 100,000 population, while Fayette County is the highest at 58.8 overdoses per 100,000 population and Spencer County being the lowest at an estimated 3.9 overdoses per 100,000 population.
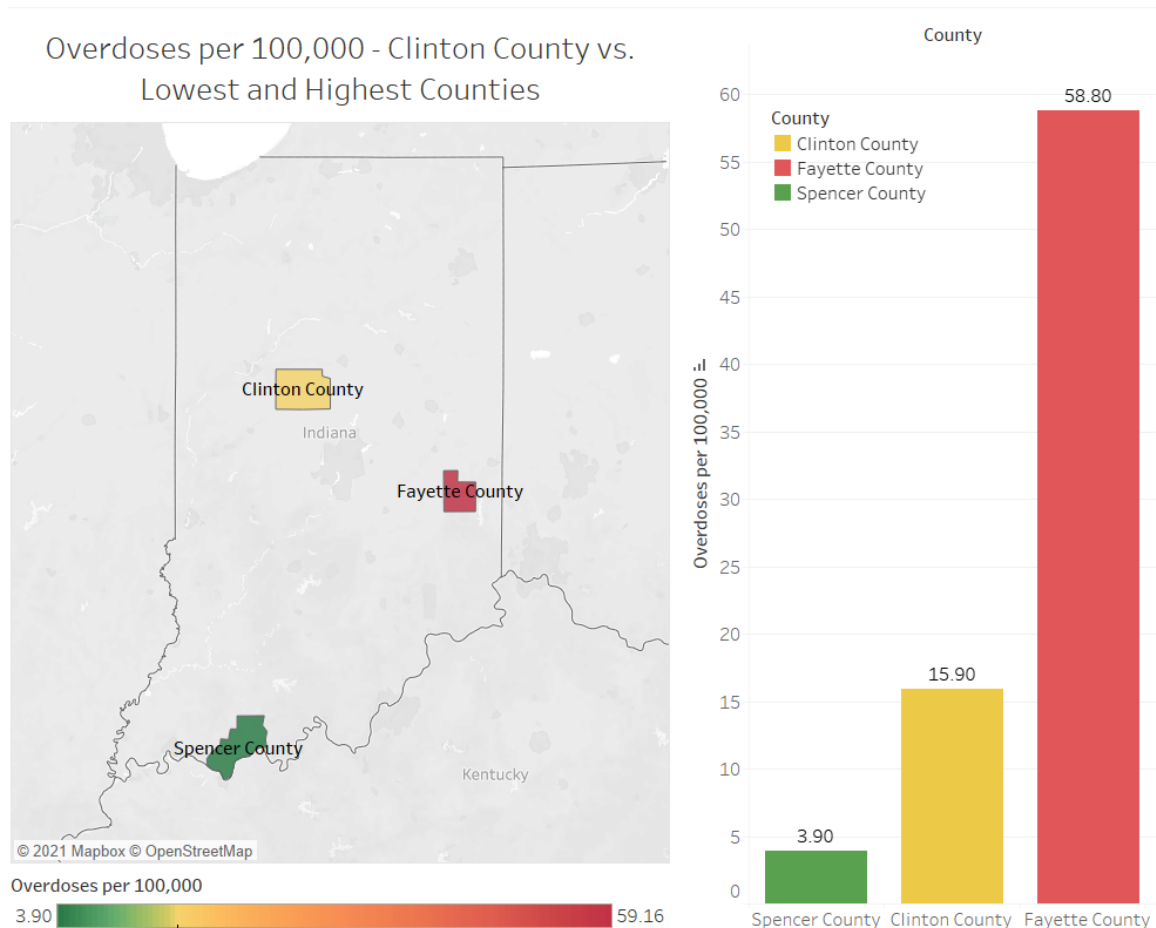
# Appendix D - Diversity Statement

Some of the most enlightening outcomes are generated by diverse teams working together to solve complex problems.  What does diversity mean and why is it important? Merriam-Webster defines diversity as: 1) the quality or state of having many different forms, types, ideas, etc., 2) the state of having people who are different races or who have different cultures in a group or organization. When solving complex problems having adequate representation is important. In the context of the hackathon, diversity could mean (but is not limited to): varied perspectives, varied points of view, different academic majors represented, different academic levels (Freshmen, Sophomore, Junior, Seniors) on the team, different ethnicities (state this professionally). Having a diverse team from different backgrounds can boot engagement and productivity and make us smarter (read short article: "How diversity actually makes us smarter").

A Made-up Diversity Statement (**DO NOT copy and/or paste this example as your own**).

Diversity is important because it is all about acceptance and teamwork. Even though members of a group or a country might come from different places, they are still part of the same group or country. A diverse group is better than a group that has only the same type of people. Each member of a diverse group brings their own values, education, and background to the project. This makes the project better, since there are multiple points of view in it, rather than just one that may be biased. The members of the Hackathon group JGN Data all come from the United States, and all come from Indiana, and go to the same school, but that is where the similarities really end.

George Wu is a freshman in Web Programming and Design. As a freshman, he had better knowledge of what he learned in high school, since he has been out of high school for a shorter amount of time. He is also from Hamilton County, which is directly north of Marion County. Hamilton County, or at least his home city of Fishers, has had a large and problematic opioid epidemic issue for a relatively long time. The schools he went to taught him about the opioid epidemic; as a result of the huge opioid crisis in Fishers, the schools made education about drug abuse a huge part of the curriculum. In his junior year of high school, he did a project about fentanyl, a powerful and dangerous type of opioid, in health class, where he learned that the problem was worse than he had thought.

Joshua Bailey is a sophomore majoring in Virtual Product Integration. He is from a small town in Newton County called Roselawn. His smalltown background added diversity to the group by displaying that the opioid epidemic is a problem even in a smalltown setting. Being the only sophomore in the group he added a different perspective from the other members of JGN. Joshua has also spent time in Alaska among the Athabascan natives in Minto Village. Even in this small village six hours away from any civilization Josh witnessed drug and opioid abuse.

Nathan Rusk is a junior majoring in Web Programming and Design. He is from Clinton County, Indiana, more specifically Frankfort. This a fairly rural area, where he did not witness or hear of very many firsthand accounts of the opioid crisis. Therefore, the data is relatively new to him. Nathan's education background includes software development, which he was able to utilize in the making of the team's project web page, as well as other aspects of the project.

# Appendix E – Team Consensus

## Team Consensus

I have read and approve of the content as a representation of the team's work and my contribution.

| Team Member (full name) | Signature | Date |
|---|---|---|
| Joshua Bailey | *Joshua Bailey* | 12/9/2021 |
| George Wu | *George Wu* | 12/9/2021 |
| Nathan Rusk | *Nathan Rusk* | 12/9/2021 |

References

"Opioid Overdose Deaths by Age Group." *KFF*, 16 Mar. 2021, https://www.kff.org/other/state-indicator/opioid-overdose-deaths-by-age-group/?currentTimeframe=0&sortModel=%7B%22colId%22%3A%22Location%22%2C%22sort%22%3A%22asc%22%7D.


"Drug Overdose Epidemic in Indiana: Behind the Numbers." *www.in.gov*, Indiana State Department of Health, Oct. 2019, www.in.gov/health/files/85_Drug%20Overdose%20Data%20Brief_2019.pdf.